

**CONTRACT DISTRIBUTION SYSTEM FRAMEWORK WITH CASE STUDY ON PC
BUILDING MARKET**

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KHALIF AMIR BIN ZAKRY

This project is submitted in partial fulfillment of the
requirements for the degree of
Bachelor of Computer Science with Honours
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UNIVERSITI MALAYSIA SARAWAK

2019

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ABSTRACT

The focus of this FYP project is to establish a Contract Distribution System Framework that provides someone with adequate proficiency in IT or a small startup company, a generic foundation to build upon their own personalized Contract Distribution System. Grab, Airbnb, and Fiverr are Contract Distribution Systems that have been specialized into their own specific niche. This Contract Distribution System Framework will provide the base and generic features common among commercially available Contract Distribution Systems thus making development shorter and enabling the creation of Minimal Viable Products for validating business ideas, quicker. As a show of concept for this framework, the use case of a PC Building Market is chosen for its potential of being a commercially viable application mixed with the support from the rising trend of desktop live streaming, gaming entertainment and electronic sports.

ABSTRAK

Tumpuan projek FYP ini adalah untuk mewujudkan Rangka Kerja Sistem Pengagihan Kontrak yang membolehkan seseorang yang mempunyai kecekapan yang mencukupi dalam IT atau sesebuah syarikat permulaan yang kecil, asas generik bagi membina Sistem Pengedaran Kontrak mereka tersendiri. Grab, Airbnb dan Fiverr adalah Sistem Pengedaran Kontrak yang telah dikhususkan ke dalam bidang industri mereka sendiri. Rangka Kerja Sistem Pengedaran Kontrak ini akan menyediakan asas dan ciri-ciri generik yang lazim ditemui di kalangan Sistem Pengagihan Kontrak yang sudah tersedia secara komersial yang jesteru membolehkan process pembangunan menjadi lebih pendek dan membolehkan penciptaan Produk Berkemampuan Minimal untuk mengesahkan idea perniagaan dengan lebih cepat. Sebagai pertunjukan konsep bagi rangka kerja ini, kes penggunaan Pasar Pembuatan PC dipilih oleh kerana potensinya untuk menjadi aplikasi yang berdaya maju secara komersial dan dicampur dengan sokongan dari trend aliran live streaming di desktop, hiburan permainan computer dan sukan elektronik.

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Chapter 1: Introduction

1.1 Project Title

Contract Distribution System Framework with Case Study on PC Building Market

1.2 Introduction

Due to the rise of modern business models such as sharing, gig, collaborative, freelance and on-demand economy, more jobs are being provided by online mediator platforms than ever before. Grab and Airbnb has become a prime example of how an online platform can turn underutilized assets into a source of income, while Fiverr and Freelancer has turned freelancing into a stable income source thus allowing independent professionals to be their own boss.

These business models runs on a system that distributes tasks or ‘contracts’ to their participants for them to fulfill while the system provider, example Grab and Airbnb acts as a mediator and is responsible for creating, maintaining and making sure the system is always up and running by taking a percentage cut of the earnings gained by the fulfillment of a ‘contract’ by the participant. Example, Grab takes a 20% cut from each ride completed by a Grab Driver.

A Contract Distribution System Framework could provide someone with adequate proficiency in IT or a small startup company, a generic foundation to build upon their own personalized Contract Distribution System. Grab, Airbnb and Fiverr are Contract Distribution Systems that have been specialized into their own specific niche.

This Contract Distribution System Framework will provide the base and generic features common among commercially available Contract Distribution Systems thus making development

shorter and enabling the creation of Minimal Viable Products for validating business ideas, quicker.

For this project, the core principle is to create a Contract Distribution System Framework for a PC Building Market. This system will be able to let users submit order forms in the form of a desired PC Build and the system will distribute, manage, and organize these order forms to PC Builders who have signed up to the platform.

1.3 Problem Statement

Developing a Contract Distribution System is very costly, requires technical expertise and is time consuming. This is highly problematic for a small business or a young startup to develop and test their business idea. Unless they themselves are proficient in system development and programming, hiring developers in house or outsource is not an option as prices for such projects are expensive and not commercially viable for just testing an idea.

The development of a minimum viable product, MVP, for testing ideas is great as it allows startups or small business to try out technological approaches in delivering their service or merchandise, or just to test out the market in general (Bondarenko, 2017). But since the idea of an MVP is to test out ideas, many startups get overwhelmed with the idea of implementing too much features or missing out on important aspects of the system that they need for their own use case of a contract distribution system. The framework developed in this project will stick to the basic common features available among known contract distribution systems and help these startups/businesses in testing their ideas.

The reason PC Building market is selected to be the use case for this project is because of the exponential growth in the Esports industry and the spike in popularity of PC Building communities in Malaysia. Lots and lots of people are getting more interested in playing video games and even more are interested to participate competitively. The growth of PC sales record in Malaysia have also increased and is recording an all-time record strongest growth in 6 years (International Data Corporation, 2018). The same goes to computer peripherals and components. With the rise of the concept of on-demand economy and similar concepts, PC builders who have now only build for personal use can finally try to market their builds as a viable income source. As brick and mortar stores are slowly fading, this system could provide a platform for future business to set up shop, but this time, digitally and online.

1.4 Objectives

The main objective is to design and develop a Contract Distribution System Framework that can receive, list, distribute, manage, and organize contracts.

1.4.1 Other Objectives:

1. To research the generic process flow for contract distribution framework.
2. Design and develop features that lists, accepts, and manage contracts.
3. To evaluate the framework on a given case study (PC Build Market).

1.5 Procedures/Methodology

To develop this project a development methodology has to be applied and practiced making sure the development is organized and structured. Development methodologies are in use throughout software development in the industry and depending on which company or environment the development is taking place, the methodology changes. Different projects also require different set of methodologies depending on what is suited best. Development methodologies gives structure, improves development cost and flow, whilst mitigating the risk of project failure.

For this project, the chosen methodology is Agile Development Methodology while adding concepts and practices from an extended form of it, the Lean Methodology. Agile Development methodology focuses 12 principles which include the prioritization of early and continuous software delivery, adaptable to changing requirements at any phase of development, attention to technical excellence and good design, and others (Agile Alliance, 2019). The full 12 principles can be read in full at Agile Manifesto Org's website.

The principles of Agile Methodology by itself is enough but it is mostly dedicated towards a development team, as such I included some concepts from Lean Methodology into the development process of this project as well. The concepts added are eliminate waste, optimize the whole and create knowledge. Since this project has only one developer, optimizing time and balancing adequate usage of resource is a priority as such Lean concepts are suited.

The benefits of Agile Methodology in this project is that testing is integrated during the cycle. These checks ensure that the product delivered is quality tested frequently and is of high quality. Besides that, it also reduces risks of project failure. As the software is tested early on, the

flaws and negatives of the project is figured out early in development and can be rectified then and there. This also gives important insights into the project that may create changes in the project requirements.

Agile Development includes several stages typical with other development methodologies which are concept, inception, iteration, release, production and retirement which is similar in some of the activities as in the Waterfall Model development methodology. However, the difference between them is while Waterfall Model goes through all the stages once in the entire project, in Agile Methodology, all the stages when gone through once is called an iteration or a cycle and this cycle is repeated multiple times throughout the development period. Each cycle takes about 2-3 months in Agile unlike in the Waterfall Model where that one cycle lasts until the end of the project, thus passing each stage only once in the development. Some Waterfall Model in use by the industry does reiterate but usually in very limited numbers, 1 to 3.

In Agile Development methodology since each cycle means the repeat of all 6 stages, we can get to decide how many iterations of the cycle we need. If we do a single cycle, then it is just a normal Waterfall Model, but as we go through multiple cycles, we can validate our project requirements, design, testing and others more thoroughly.

In brief, each stage of a cycle is described as follows:

- Conception: The initial project ideation phase begins here the determining of project schedule, team members, resources etc. are being identified in this phase.
- Inception: The members of the development team are selected; task force is distributed, and financial budget is weighed in this phase.

- Iteration: Design and development phase is conducted in this stage. Programming and diagrams are being drawn to fulfill project requirements and working software is developed.
- Release: Testing, documentation, and market test.
- Production: Maintenance and patches for software upgrades and fixes.
- Retirement: End of project cycle and stops here if stakeholders are satisfied and agree with the project handover terms.

1.6 Scope

For the scope of this project, the Contract Distribution System Framework will focus on the use case of PC Building Market. The consensus of the potential user base will be focused in the state of Sarawak and Malaysia with a target for potential market growth.

The initial PC Builders that sign up for the platform, are from established and small-scale PC Building shops and IT stores locally in the Kuching who handles PC Building as a part of their business. This will offer them a chance to expand their market outreach by using the platform to conduct their PC Building service as an on-demand service online. Users from around the state and country can submit PC build orders online and these shops can take on those contracts via the platform.

The scope of the project is also limited to submitting, organizing, managing, and distributing contracts as those features are going to be tested to ensure the framework can provide the essentials for a Contract Distributing System to work. Third party online services such as online payment gateway and others will not be the scope of this final year project.

1.7 Significance of Project

This project will help other developers, startups and small business create a basic Contract Distribution System to test their ideas and concept. Students can also refer to this framework to develop their own Contract Distribution System or explore the inner workings and programming source code for academic purposes. Regarding the use case on the PC Building Market, PC Builders in state or country can sign up and be a builder on the platform. They can market their PC Building skills while also giving competitive prices on PC Building services for normal people who wants to build a PC but does not have the expertise to do so.

This allows for a thriving marketplace where an on-demand economy gives value to PC Builders as well as to people who are looking for someone to build a PC.

This project can also be a showcase for how these new techs based economic business models can fit into our modern society. Where marketplaces are now online and trade occurs virtually, giving insight for interested individuals or organizations a view into the future of commerce and how they can apply a Contract Distribution System in their business operations.

1.8 Project Schedule

Since Agile Methodology is used, the project schedule will be made using a sprint plan typically used in scrum (a part of Agile) as it is able to showcase the number of iterations/cycle in this project, the timeframe of each cycle as well as the milestones in the project.

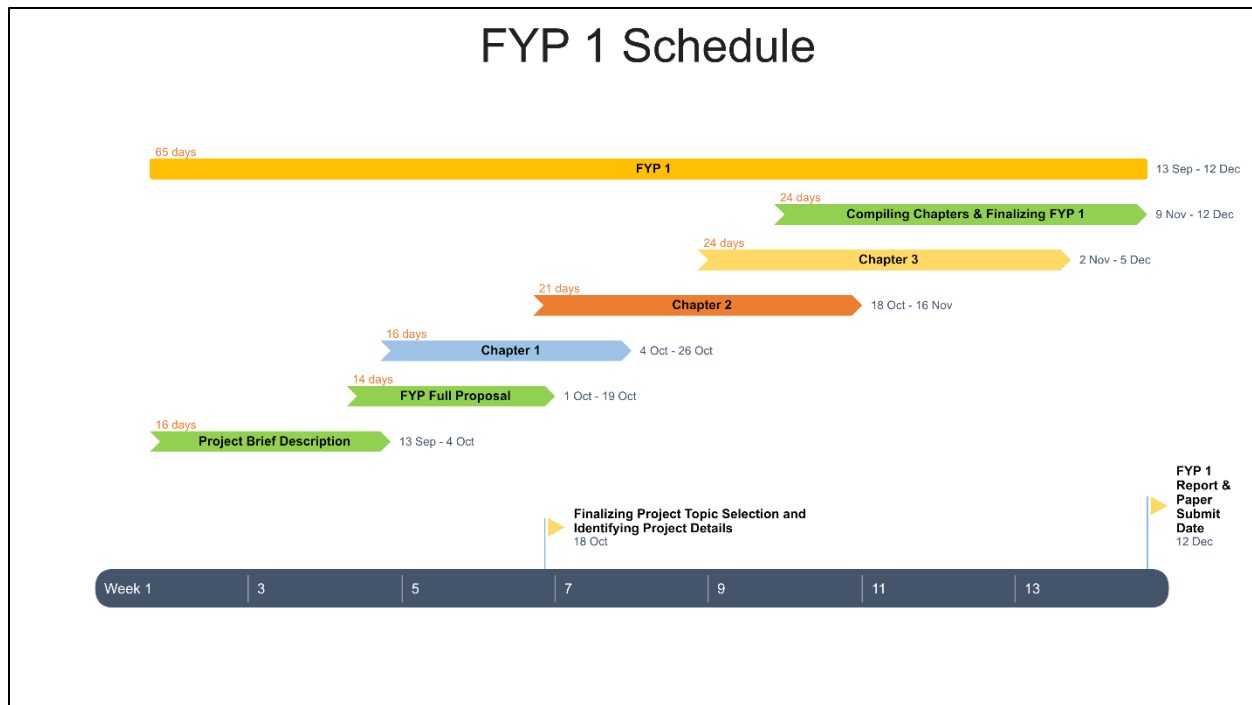


Figure 1.0: *FYP 1 Sprint Plan*

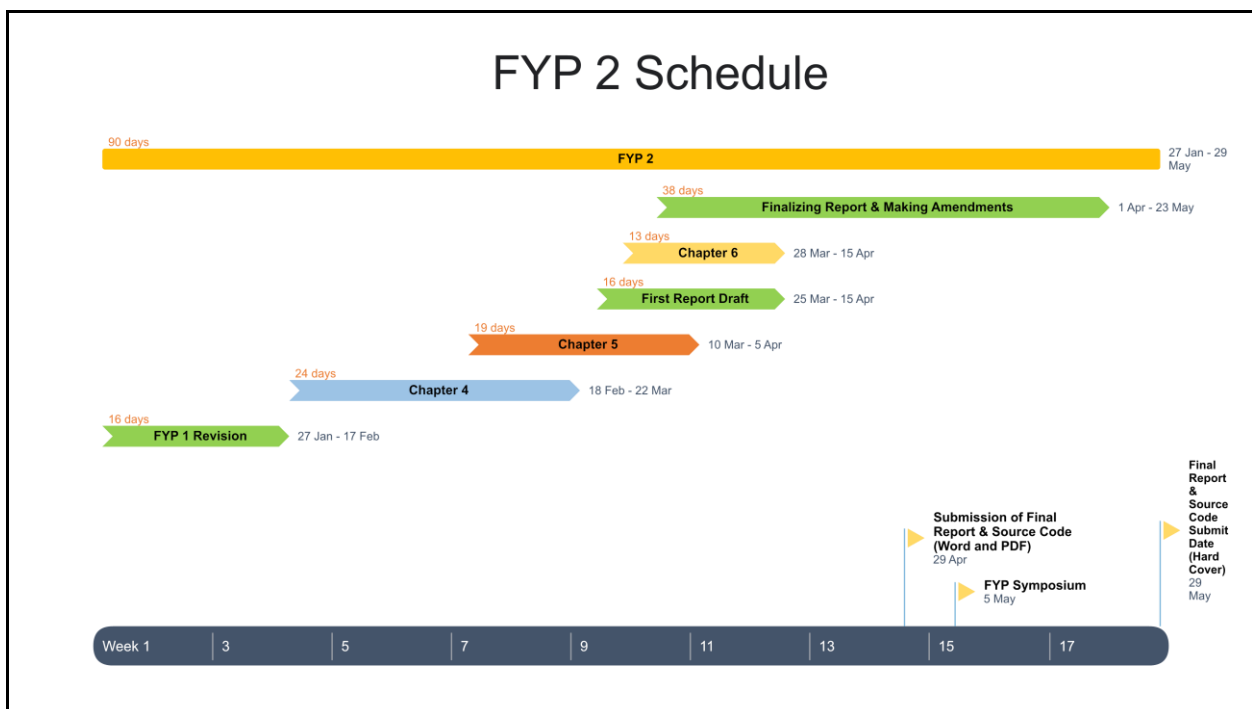


Figure 1.1: *FYP 2 Sprint Plan*

1.9 Expected Outcome

The expected outcome for this project is a Contract Distribution System Framework with the use case of a PC Building Market. The PC Building market is able to list, distribute, organize and manage PC Building contracts in the form of orders. The Contract Distribution System Framework build for this use case has to be generic and can be applied to other use cases easily as it has the basic features and functionality for a Contract Distribution System. The source code and other parts of the framework must be easy to understand, read and documented to make sure it can be adopted by other developers for other use cases.

1.10 Project Report Outline

1.10.1 Chapter 1: Introduction

This chapter is meant to give an overview of the project to the reader. The project introduction and description will brief on the “What, When, Where, Why and How” of the project. Chapter 1 highlights the problem statements, the target scope, project schedule and other necessary information that can help the reader in understanding the overall aim of the project and the contents in the later chapters of this final year project report.

1.10.2 Chapter 2: Literature Review

In chapter 2, review is done on current existing methods or on similar systems that is available. The sources for this chapter can be obtained from online articles, book, journals, and conference papers. The discussions on those methods and systems helps set a guideline and overall outlook on the proposed system. The features, objectives and goals of the existing methods and similar systems are compared with the proposed system and discussed.

1.10.3 Chapter 3: Requirement Analysis and Design

Chapter 3 focuses on the methodology and practices used for the development of this project and the development of the proposed system. Discussed are the phases and activities involved in the phases of the Agile Development Methodology as well as the benefits of the Lean and Scrum practice that is applied for this project. From system analysis and requirements elicitation via information gathering methods, the results are mentioned and its impact towards the choices for the proposed system design are discussed. Design of the proposed system and its interface are planned, created, and discussed such as the Data Flow Diagram (DFD), Entity Relationship Diagram (ERD), Data Dictionary and mockup designs of the system's use interface.

1.10.4 Chapter 4: Implementation

Chapter 4 will describe the implementation phase of the proposed system. The designs in the previous chapter, Chapter 3, will be used as the guide for the development of the proposed system. Details regarding the implementation of the system which includes the prototype of the system will be discussed in this chapter.

1.10.5 Chapter 5: Testing

Chapter 5 focuses on the testing done on the prototype of the proposed system. The results are recorded and discussed in detail. This chapter will also include an explanation on the type of testing used.

1.10.6 Chapter 6: Conclusion and Future Work

Chapter 6 will provide a conclusion on the development of the proposed system as well as on the entire project. The lessons learned and gained from the project is detailed in this chapter.